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Pupa in a leaf, very dark brown.

***Thermecia paucula* Walk.** A light green semi-looper, a narrow band of pinkish white along each side, in the center of which is a fine line of pink; a yellowish line between each segment. Tubercles minute, white, with whitish hairs. Head green, shining. When young the larva is entirely light yellowish green.

Pupa chestnut brown.

Food-plant.—Wild creeper growing on rocks.

***Hypena obditalis* Walk.** A green semi-looper with a whitish line down each side; a pale yellowish line between each segment. Setæ very fine, black.

Pupa very dark brown.

PRELIMINARY NOTES ON THE LARVÆ OF THE GENUS ARCTIA.

BY HARRISON G. DYAR.*

I think it would be very appropriate if the members of this society should attempt to find out what is still unknown about the life histories of our species of *Arctia* or *Euprepia*, as the genus is now called. It is a specially interesting one as we have a number of closely allied forms, the exact limits of which are still imperfectly known. The larvæ resemble each other closely, yet present some well marked points of difference. As the species are all rather common and so many of them live in our usual collecting grounds, it ought to be comparatively easy to find them and work the matter up. As a preliminary to this work, I will briefly review for you how our knowledge of these larvæ stands at present. You will be able thus to avoid duplication of work, and also to correct the previous work, where it has been erroneous. As some of you may receive eggs of larvæ from correspondents in different states, I will review all the matter that is accessible concerning the North American species. Some of this, gathered from the material in the National Museum and the notes of the Department of Agriculture, has not been published.

*Read before the New York Entomological Society, December 20, 1898.

The last revision of the genus recognizes 23 species. We will consider them under two heads, those inhabiting the Eastern States, and those not found there.

EASTERN SPECIES.

Lining of the median vein broad.

Veins all lined.

1. *virgo* LINN.
2. *virguncula* KIRB.
3. *Michabo* GRT.
4. *age* DRU.
5. *quenselii* PAYK.

Veins, except the median, not lined.

6. *nais* DRU.
7. *phalerata* HARR.
8. *vittata* FAB. (*decorata* Saund.)

Lining of the median vein linear or absent.

Veins all lined.

9. *intermedia* STR.
10. *parthenica* KIRB.
11. *anna* GRT.
12. *rectilinea* FRENCH.

Veins not lined.

13. *phyllira* DRU.
var. *figurata* DRU.
14. *placentia* SM. & ABB.

1. *Virgo* as moth is a distinct and well marked species. Superficially, smaller specimens resemble *intermedia* or *parthenice*, but are always distinguished by the broad lining of the median vein and the two discal spots of secondaries. *Michabo* is the nearest ally, but these species have a different facies and are not likely to get mixed together. *Virgo* is abundant, particularly northward, and is a striking species, readily attracting attention; yet our knowledge of the larva is incomplete. The mature larva is black, abdominal feet and subventral warts reddish; hair bristly, black, reddish subventrally and at the anterior end; no markings on the skin. The larvæ hibernate nearly full grown, apparently in the penultimate stage or in the one before that, width of head 2.4 or 3 mm. I think there is only one annual generation and the hibernating larvæ feed up in the Spring to emerge as moths in late July and early August. A number of descriptions of this larva are extant, but are brief and do not cover all the stages. Abbot's figure is much too pale and Stretch describes the larva as having a narrow flesh-colored dorsal line. It remains to be determined whether the larva ever really varies to this extent, and the full life history, including all the larval stages, should be described. The characterization that I give of the larva is taken from the specimens in the National Museum (Dept. Agr. no. 2484) and from some living specimens received from Mr. Doll in the late Fall of 1893.

2. *Virguncula* is also a neatly distinct species not likely to be confused with anything. The absence of the transverse lines and the yellow secondaries give it a very characteristic look. About the larva very little is known. The moth flies early; I have not taken any after the middle of June and I presume the larva must hibernate full grown. I have not had the larva, nor has it been bred at the Department of Agriculture. A brief description has been published by Mr. Coquillett, but I cannot gather from the description anything that will distinguish the larva from that of *virgo*. Practically everything is still to be learned about this species.

3. *Michabo* is a peculiar form, in markings close to *virgo*, but in color so near *arge* that the two are liable to be confused, and have been so in some collections. It is a simpler form than *arge*, the bands retaining their usual shape, only the inner one being occasionally somewhat tooth-like. The species ranges throughout the Atlantic States like the preceding, but it is commoner southward. I have no dates of flight, except one record of emergence of a moth from Florida on April 15th. The larva doubtless hibernates full grown. No description is extant; but fortunately I have a blown larva before me from the Riley collection as well as cast skins from the Department of Agriculture and some notes (Dept. Agr. no. 2588). The larva is grayish black, head black, the body rather grayish brown, with a broad, distinct, straight, cream-colored dorsal stripe. Hair rather long and, though coarse, somewhat soft and brownish. Spiracles white. The notes add a more or less interrupted white subdorsal line, but it does not show in the blown or alcoholic specimens nor in the cast skins. The larva is a close ally of *arge*, but differs in the absence (or reduction) of the subdorsal lines. The full life history is needed.

4. *Arge* is probably our best known species. The moth is peculiar and distinct with its broad vein linings, tooth-like bands and pale pink coloration. It is double brooded, the moths flying in May and July-August. The full grown larva is not infrequently met with late in Fall or in warm days in Winter, having emerged from hibernation. It is grayish black with dorsal and subdorsal lines alike broad, distinct, cream-color, and a broken, waved subventral line; the warts grayish, the hair rather long, coarse, but not bristly, brownish or gray. There are eighteen descriptions of this larva extant and I have notes on all the seven stages* of the first brood, taken from larvæ that Dr. Seifert

* Width of head .3, .4, .65, 1.1, 1.4, 2.0, 2.5 mm. (♀).

kindly furnished me with in 1897. In the first stage the larva has simple setæ, except on wart iii on joints 5 to 13 which bears two hairs, no subprimary setæ. The mature markings are outlined in stage II when the warts appear, and the successive moults disclose no striking differences. I find the moths mate readily in the mating cage, the male flying in during the night.

It might be well to determine the number of larval stages under varying conditions, and especially of the second or hibernating brood, always giving the width of head for each stage. Otherwise the larvæ are fairly well known.

Department of Agriculture numbers are 728P, 1045, 2451, 4117, 4119 and 5865.

5. *Quenselii* is strictly an arctic species. It occurs in the cold parts of both Europe and America, our nearest points being the summits of the White Mountains of New Hampshire. The moth has the usual melanotic and blurred appearance of arctic forms and the lining of the veins varies considerably, so that, in my seven specimens, I cannot always say that the median vein is broadly lined. However, the species is distinct enough in appearance from all other common forms.

The larva is known from European material; Hoffman figures it black with pale dorsal line, the subventral hairs reddish. The only American description is one by Dr. Packard of a "supposed" larva of *quenselii*, taken on the summit of Mt. Washington. I have had a larva very like this from the same place, sent me by Mrs. Slosson in 1895; but I failed to breed it. As neither Dr. Packard's larva nor mine correspond with the European *quenselii*, and they are not unlikely to belong to some other species, we must await the result of positive breeding.

Any of the members visiting the summit next season would do well to search for *quenselii*. It has been noted in Europe that the moth appears only in every other year.* The same may be the case with us.

6. *Nais* is on debatable ground. This and the two following species are doubtfully distinct and often confused. It is not certain whether we have three, two, or but one species. The matter is further confused by wrong determinations and the larvæ also are much mixed as I shall proceed to show. I have before me 50 moths that I

* Sandberg, Ent. Tidsk., IV, 16.

attribute to *nais*, 20 each of *phalerata* and *vittata* (*decorata*). The *nais* vary much in the degree of obsolescence of the bands and in the color of the hind wings ; but they all agree in having the costal edge of primaries narrowly black. The species is double brooded, flying in June and August.

Concerning the larva, I can find no description that can be reliably referred to this form. I have, however, a blown specimen from the Riley collection (no. 333) and notes from the Department of Agriculture (no. 2582) with the moths correctly associated. The larva is brownish black or brown with a very faint, narrow, whitish, dorsal line, not at all contrasted. The hairs are short, stiff, grayish black, reddish subventrally.

Professor French describes the life-history (six stages), but his determination of the moth is doubtful. One specimen seems to have been *phalerata* and of the other the determining character is not given.

The full grown larva may be taken early in Spring, hibernating under stones. It is a common species, and ought to be fully worked out soon.

7. *Phalerata* resembles *nais*, but the costal edge is yellow and there is scarcely any tendency to the obsolescence of the markings. My 20 specimens are very uniform. This does not prove specific distinctness, of course ; but I was impressed with the fact that a gap seemed to exist between this form and *nais* at the time that I was collecting both forms at Poughkeepsie, N. Y. I have taken *phalerata* in August, and have a date of issue, March 30th (Dept. Agric. 2580), making it double brooded with hibernation as mature larva, as in *nais*. Concerning the larva, Professor French's description, seemingly referable here, gives it a dorsal nankeen yellow line, expanded somewhat in the middle of each joint. This would be quite distinct from the other forms ; but the notes of the Department of Agriculture, of which I have the moth before me, an undoubted *phalerata*, are different. They give a black larva resembling *virgo*, but the warts not polished ; no dorsal line is mentioned.

The members ought to settle this contradiction and work out the full life history of this interesting form.

8. *Vittata* (*decorata*) is closely allied to *phalerata*. The costal edge is likewise yellow, but there is a great tendency to melanism ; the W-mark is lost in all the females and rarely complete even in the males. The hind wings vary from yellow to red, but tend to a very broad outer black border. The abdomen, too, is often largely black.

The species is a trifle larger than the two preceding. The appearance of my 20 specimens is quite different from *phalerata*, but yet I have no strong character to separate them by. Professor French's description of the larva makes it black without a dorsal line. I have three alcoholic larvæ (Dept. Agr. 2587 and Riley coll. 1261) as well as descriptions (Dept. Agr. nos. 2544, 2581 and 2587). The bred moths are *vittata*, but not all perfectly typical as in none of them, except no. 2544, is the abdomen broadly black. The larva of the typical *vittata* (no. 2544) is said to be black, body olive, the warts black and rough; hair brown, lighter in front; spiracles orange. This agrees with Professor French. The others are the same; but in no. 2581 "an indistinct pale orange dorsal line" is mentioned and one of the alcoholic no. 2587 has a distinct, broad, broken white dorsal line. Of course these larvæ may have been mixed; but the matter is not decided beyond question as to whether *phalerata* or *vittata* has the larva with the dorsal stripes, or whether this is a specific character at all.

I believe some of the members are more familiar with these forms than I am, and I hope they will put their notes together for publication. Much evidence from many sources is needed in this connection.

9. *Intermedia* is often confused with *virgo*, but as I have shown you already, quite unnecessarily so. The moth inhabits the Atlantic states, but has a southern range. Specimens occur in New York, but I do not think it is common here or extends much farther north. It is simply an enlarged edition of *parthenice*, which replaces it in the north, the transverse bands more distinct and more frequently traversing the submedian bar. There are absolutely no firm characters between this and *parthenice*; but the life history is entirely unknown, and it may be found to furnish some further points of difference. I recommend this species to your attention, as any information on the early stages will be worthy of note.

10. *Parthenice* is fairly common in the northern Atlantic states, northern New York, New Hampshire and Maine to Wisconsin: southward it is replaced by *intermedia*. The moth flies in August, somewhat later than *virgo*, with which it is usually associated. I think there is only one annual generation. The species is allied to *intermedia*; as I have shown; but it is also very near to *rectilinea*. The veins are a little more heavily lined than in *rectilinea* with no tendency to obsolescence, and the bands are more or less bent, not rigid. The color of the hind wings, too, is a little more orange-red. Again

parthenice comes very near *anna*. In fact, it has been suggested that *anna* was only a form of *parthenice*. *Anna* has yellow hind wings and a much greater tendency to melanism ; but the pattern of the fore wings is almost identical. Thus *parthenice* is a central form with close allies on all sides, leading through *rectilinea* to *phyllira* and the group without linings on the veins, and through *anna* to *ornata* and the western species.

The larva has been described by Saunders as black, with a flesh-colored dorsal stripe and yellowish warts and feet ; but this was many years ago, and the observation has not been verified. Larvæ, which I have had from eggs of *parthenice*, did not agree with this description, but were almost absolutely indistinguishable from those of *virgo*. They were, however, much smaller and hibernated in the fourth or fifth stage, less than half grown ; width of head .9 or 1.25 mm. I have not seen the mature larva, and it is possible that it may agree with Saunders' description, though I fear that this is unlikely, as it is not customary for the dorsal line to reappear after it is once lost. The process is usually the reverse.

11. *Anna* is really the variety, being the rarer and aberrant form of *persephone* ; but the name was published earlier. The secondaries are yellow with a strong tendency to melanism. In my 12 specimens, none have the outer black border broken through, and one has the wings wholly black. The fore wings are like *parthenice*, but the longitudinal bands are occasionally very heavy and the submedian stripe usually runs closer to the median vein. The species is, undoubtedly a good one, though very near to *parthenice*. It inhabits the dry oak woods of Long Island and New Jersey, extending well south, but also into northern New York, Missouri, Nebraska, Iowa and Wisconsin. It is never very common, though well distributed in its wide range. The moths appear in June, and I think there is but one annual generation. The larva is entirely deep black, with shining warts and stiff black hairs, alike in color throughout. I have described the life history up to hibernation (Psyche, viii, 53) which seems to occur in the last larval stage. This point is not certain, and hibernated larvæ should be looked for in April or May, and the heads measured to determine whether there is any moult in the Spring.

12. *Oithona* (*rectilinea*)* is a puzzling form. We naturally

* *Oithona* Streck. is an aberrant form of *rectilinea* French, as I learn from an examination of Dr. Strecker's type.

associate it with the species with the veins lined, yet, except for this character, it is absolutely the same as *phyllira*. In fact, several of my old specimens are labelled *phyllira*, and this is probably the reason that the form was left undescribed by the early authors. Now, the character of the linings of the veins is not fixed in this case, as it usually is. I have two specimens in which the linings do not attain the outer margin; others in which only the subcostal, median and internal veins are lined on basal portion, in fact true intergrades to *phyllira*. I feel quite certain that *rectilinea* is only a form of *phyllira*; just the same relation between them as between the western *ornata* and *achaia*; but to clinch the argument, we must do some breeding to get either form from the other. I trust the opportunity will arise to some of us.

The larva has not been described and none of my 22 specimens are bred. The range is all over the eastern part of the country, New York, New Hampshire, Illinois, Missouri and Mississippi.

13. *Phyllira* is again a central form around which clusters much uncertainty. My ten specimens do not vary much. There is in some a trace of lining on the median vein, completing the links with *rectilinea*, and in a few the bands are somewhat broken up and abbreviated; but it is the inner bands that are affected first and the W-mark remains the most distinct. The secondaries are very uniform with the narrow black edge, three submarginal spots and small discal spot, the latter sometimes absent. The species is southern in its range. I have nothing north of Maryland and most of my specimens are from Florida. This is surprising if we have to do with an alternative form of *rectilinea*; but may be due to the smallness of the collection, as *phyllira* is not often taken now. Or else it may be due to climatic causes.

The larva was figured by Abbot and Smith in 1797. There are no descriptions since. I have, however, blown specimens from the Department of Agriculture (no. 2494) and they agree sufficiently with Abbot's figure. The insect is brown-black, mottled, with shining dorsal warts and a distinct, pale yellow dorsal line that widens almost to spots in the center of each segment and is narrowed, or even broken in the incisures. The hair is short, black and bristly, grayish sub-ventrally.

Most of the details of the life history remain to be determined.

Celia Saunders (*franconia* Hy. Edw.) has been made a synonym of this species. It differs in the yellow secondaries with a strong ten-

dency to melanism, confluent basal spots being present. The range is northern. I have a specimen from northern New York and I know of no southern records; but my material is extremely limited. Saunders describes the larva as brownish black, the hair black, brownish sub-ventrally and at the ends, abdominal feet yellowish. No dorsal line is mentioned and the larva would appear very distinct from *phyllira*. It needs thorough investigation.

Figurata (*f-pallida* Streck., *excelsa* Neum.) has been made a variety of *phyllira*. It is a melanotic form, but the melanism affects first the outer borders of the wings, so that the W-mark is absent even when the other lines are bright and distinct and the secondaries have an even black border. The hind wings are either red or yellow. It is a southern form and is but rarely taken. It reaches southern New York where Mr. Graef collected a female and by fortunate breeding secured a number of examples. I have also from Staten Island larvæ labelled *figurata* (Dept. Agr., no. 2552); but none of the moths are before me so that I cannot verify the determination.

Mr. Graef describes the larva as black, mentioning no marks. My blown larvæ agree, but the hairs are a little brownish, and there is a very faint, straight, whitish dorsal line, broken or continuous, easily overlooked on cursory examination. In one of four alcoholic specimens the lime comes out very heavy and distinct; but of course there may have been a mixture of species.

I see no essential difference between the larvæ of *celia* and *figurata*; but the considerable difference of *phyllira* shows that the whole matter of synonymy as well as the life histories of the forms needs to be studied further.

14. *Placentia* is a peculiar and distinct form inhabiting the South. The records are Georgia, Florida, Kansas and Texas. It may range further north. Indeed I should expect it would be found as far as Long Island in open, sandy districts; but this may not be the case. The fore wings are black, diversified by only a few pale dots, rarely indicating the usual lines, but always broken up. The hind wings are much as in *figurata*. I found the species at Miami, Florida, in the sandy pine barren and got the larva as far as stage III. The first stage was as usual in the genus, single hairs, except wart iii on joints 5 to 13, which bears two hairs; no subprimary setæ. In stage III the color was blackish without lines, the hair black, short and gray sub-ventrally. Abbot and Smith's figure of the full grown larva is gray,

the dorsal stripe red, yellowish and broken in the incisures; head and hair black. There has been no verification of this figure; and larvæ that I got in Florida, which I thought were *placentia*, were quite different. However I did not breed them, and the matter is still open.

WESTERN SPECIES.

Abdomen as usual with a row of dots or a band.

Moderate sized species.

15. *ornata* PACK.

16. *obliterata* STR.

17. *nevadensis* G. & R.

18. *superba* STR.

19. *williamsii* DODGE.

20. *favorita* NEUM.

Small species.

21. *convinoides* STRECK.

22. *blakei* GRT.

Abdomen nearly immaculate with a heavy black tip.

23. *proxima* GUER. (*docta* Walk., *autholea* Bd.)

15. *Ornata* has two forms, very distinct at first sight, but intergrading. The typical *ornata* is without linings on the veins, and occurs sparingly in the southern part of the range of that species. I have it from San Francisco, Lake county and Mariposa county, California. The species as a whole ranges along the west coast from California to British Columbia. I do not know the exact limits of distribution. The variety *complicata* is dominant in Portland, Oregon. This species is the western representative of *anna*, from which it differs in the greater number of bands on the forewings and the tendency to orange of the hind wings. The spotting of the latter also runs somewhat differently. In the occasional disappearance of the vein linings, it resembles *oithona-phyllira* as already noted.

The larva (form *achaia*) has been described by Stretch, who makes it black with a double, somewhat waved, dull reddish dorsal line; feet flesh color; hair light brown, soft and silky. My larvæ (from *ornata*, Psyche, vi, 386*) were finally black with the subventral hairs reddish and no lines. They did not reach maturity, and I do not know whether they would have appeared like Stretch's or not; I think not.

This species will have to be gone over again; perhaps more than once.

* I described these as *blakei* (*nevadensis*), mistaking the female *ornata* for a moth of the group without the vein linings. Subsequent specimens from the same locality give the hint as to what the species really was.

16. *Obliterata* is only a name, and the species, if species it be, is not known beyond Stretch's description. As far as this description goes, it suggests a *quensellii* with red wings; but I do not know if such a thing ever occurs.

17. *Nevadensis* is one of the forms that inhabit the arid region from southern California and Arizona, through Colorado and Nevada to eastern Washington and Montana. You may have thought that the eastern species were in some confusion, but they are quite plain in comparison with the confusion that exists here. Whether there are half a dozen species, or only one, I am unable to say; but I will treat them as in the last revision, making four species. *Nevadensis* with its forms *incompacta* and *nevadensis* is the most abundant. The veins are unlined, but the transverse maculation is fully present, four bands beside the W-mark. In one form the bands are rather narrow, in the other (*incompacta*) broad. *Nevadensis* has the thorax black. It looks very distinct, and I have no intergrades; but it occurs with the wings of both the narrow and broad banded forms and scattered all over the same regions. Besides Dr. Strecker has specimens with the black thorax and without it, said to have been bred from the same brood. Mr. Coquillett has had the larva of *nevadensis* (black thorax) in southern California and tells me that it is black with a broken dull white dorsal line; the hair brown.* This is essentially the same as that of *superba*, the next species. Nothing is known of the early stages of the forms without the black thorax.

18. *Superba* was separated from *nevadensis* as the secondaries seemed redder. This character is not at all marked, and otherwise

* *Arctia nevadensis* Grote.

Larva. Body black, with a purplish tinge, the portion below the spiracle lighter, more grayish, a broken, dull white dorsal line; warts light gray, hairs issuing from them in spreading clusters, not concealing the ground color, mixed black and reddish or black and yellowish, the red and yellow hairs most numerous in the middle of the dorsum and low down on each side of the body and varying in color from a bright brick red to a pale straw yellow; spiracles yellowish brown, ringed with black; head black, the sulcus on top between the two lobes, usually the sides and lower margin of the clypeus, and a dot at the base of each antenna, yellow; mouthparts marked with yellow anal and abdominal prolegs largely pale yellowish; length, 36 mm. Found a great many from half to nearly full grown feeding upon various plants at Santa Monica, Calif., March 14, 1891. Placed leaves of *Malva borealis* in their cage, and they fed greedily upon them. One moth issued July 29th; at this date two were chrysalids and ten were larvæ. The remaining moths issued in August and September.

D. W. COQUILLETT.

the markings are the same, except that the lines are more broken up. The form comes from the rainy coast region of the Northwest. We have specimens from Easton, Washington, with a blown larva. This is black, dotted with pale, a white dorsal line broken into three small spots on each segment; hair mostly brown, even well up on the back, short, bristly.

Geneura Streck. is referred here as a synonym, but it has the full banding, the bands rather narrow, and differs from the *nevadensis* form in that the secondaries have larger spottings. The thorax is lined. It comes from Colorado.

19. *Williamsii* is again the variety with *determinata* Neum. as the stem form, but the varietal name has priority. The form is distributed with *nevadensis*, but mostly in the higher altitudes or northern parts of its range. The black color of the wings has turned to a faded brown, except centrally, and the transverse bands are reduced, beginning at the base, to two, or but one, beside the W-mark. The secondaries are often considerably blackened. This may be the high altitude *nevadensis*, just as *superba* may be the rainy region form of the same species. The larvæ are not known.

20. *Favorita* is a curious blurred form; otherwise it is nothing but *phyllira*. I suspect that this is only *phyllira* migrated to the Rocky Mountain region. I have seen very similar specimens from Grand Rapids, Michigan. The larva is not known.

21. *Cervinoides* is not known to me by any specimens other than Strecker's types. It is a high altitude form, coming from Colorado. Professor Smith says "this will prove an undersized *phyllira* with black secondaries," but he might as well have said an undersized *williamsii* or a race of *quenselii*, since to modify *phyllira* in this way would be to make another species of it. I suspect that this form is Dr. Packard's "*quenselii*" of the Hayden Reports. It is in any case a form modified by cold; but its relations must be left till further investigations. The larva is not known.

22. *Blakei* (*bolanderi*)* is a small species with brown (not black) fore wings and yellow hind wings, marked like *determinata*, or with even more bands. It comes from the arid region and is probably widely spread in the colder parts of this region. The type of

*After examining Grote and Robinson's type in the Academy of Nat. Sciences at Philadelphia, I find *blakei* is what I had previously called *bolanderi* and not *nevadensis*.

bolanderi was taken at Mt. Shasta, California; but my specimens, agreeing very well, are from Montana. The larva is quite distinct. Black, dorsal band vermilion red, pale in the incisures; segments white dotted posteriorly; wart iii bright red at base, the subventral warts pale. Hair stiff, reddish subventrally. I have given the full life history in Proceedings of the Boston Society of Natural History, Vol. XXVI, page 153 (1893).

23. *Proxima* is a distinct form inhabiting the arid region. I have taken it at Salt Lake City and it is very abundant in southern California. The sexes are quite dissimilar in appearance, on account of the different color of the hind wings. The species extends into Mexico. I would request collectors not to present specimens of this species to the National Museum, as we have them already by the drawer full.

The larva is black with a series of dorsal red spots, one on a segment, each pointed before; the hair is black, mixed with brown. I have described the life history (Ent. Amer., VI, 117) and the National Museum has a dozen blown larvæ prepared by Mr. Koebele at Los Angeles, California, and Ogden, Utah. It will not be necessary for you to waste much time on this common species; but if eggs come to hand, fuller observations may be made on stage I than I was able to make at the time I bred the species.

Finally I would call your attention to a few structural points that will assist in separating the larvæ of *Euprepia*. As these are not generally given in descriptions I have been unable to use them, except in the few larvæ that are actually before me. These points relate to the size of wart i, the presence or absence of a shining base to wart ii and the distinctness of the barbules of the hairs. Eight species that are before me separate as follows, which will illustrate the way in which I suggest that these characters be used.

Partial synoptic table of larvæ of Euprepia.

Wart i large, about half the size of wart ii; wart ii with shining base.

Hairs barbuled, distinctly cleft under the lens.

No dorsal line.

Hair partly red.....**virgo.**

Hair all black.....**anna.**

A broken white dorsal line.....**superba.**

Hairs smoother, only the shorter ones distinctly cleft.....**proxima.**

Wart i smaller, about one-third the size of wart ii; wart ii with shining base.

- Warts all small, hair short.....**phyllira.**
 Wart i small, about one-fourth the size of wart ii; wart ii without shining base.
 Hairs without distinct barbules.
 No dorsal line.....**nais.**
 Dorsal line distinct, subdorsal broken.....**michabo.**
 Dorsal and subdorsal lines distinct, subventral broken.....**arge.**

ADDITIONAL NOTES ON TRYPETIDÆ.

BY R. W. DOANE.

It is with a good deal of hesitancy that I dare to take issue with so eminent authority on Diptera as Mr. Coquillett. But since his recent paper on Trypetidæ (JOUR. N. Y. ENTO. SOC., Vol. 7, no. 4) appeared I have been asked to say what I thought of the synonymy as therein set forth. As the paper shows evidence of having been hastily thrown together and as I still have before me all the types described in Vol. 7, no. 2 of the same journal it may not be amiss to call attention to some of the points in the original descriptions that seem to have been entirely overlooked and perhaps add a few notes.

Spilographa setosa Doane differs from *S. flavonotata* in the following particulars.—No trace of lighter markings on thorax; dark instead of pale bristles on hind tibiæ; posterior femora with brownish bristles near tip; more brown on basal portion of the wing; bristles on the third vein extending beyond the anterior cross vein.

Trypeta straminea Doane differs from *T. occidentalis* Snow in the following particulars.—Very much smaller, only about half as large; dark reddish yellow instead of lighter yellow; pile on thorax and abdomen not so long or dense; wings comparatively narrower. Every one of these characters is constant throughout a large series of both species. They can not possibly be confused.

Eurosta conspurcata Doane differs from *E. reticulata* Snow in the following particulars.—Smaller; thorax lighter brown; no light stripe on abdomen; the ring is much longer in proportion to its breadth; the hyaline spots are larger and somewhat differently arranged especially in the posterior portion of the wing, and there are not so many small yellow spots. I have only a single male specimen of this species but it is perfect and well preserved and looks so wholly unlike any of